Resource Data Management

Mercury

PR0710-MPA
PR0722

Intuitive

PR0750-MPA
PR0722

Mercury 2 & Intuitive Mercury Mini Pack / Condenser Controller Installation & User Guide

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The Mercury & Intuitive Range

From Resource Data Management

For Version 1.3

This Mercury Mini Pack controller is primarily intended for use in Pack or Condenser control applications. The controller is available in two hardware platforms, a flush mount model known as the Mercury Mk2 and a DIN rail mounted model known as the Intuitive Mercury, both of which are designed to be used in a control panel or electrical tray. The controller has 5 relay outputs that are configurable as Compressors/Loaders, when set as Type1 or Condenser Fans when set as Type 2. The controller has 5 status inputs which can be assigned as a Stage Input, General Alarm, Standby Mode or Temperature Probe. The 6th input allows for a pressure transducer interface (PR0722) to be used. The controllers operate a staged logic control algorithm which allows the user to configure the controller outputs to achieve the desired control.

Both the Mercury and Intuitive Mercury controller have the same features with the Intuitive Mercury having additional benefits such as higher rated relays each protected by an integral fuse and fuse protection for the incoming power supply, all connections are plug in socket. There are multiple network interfaces to choose from including Ethernet.

The controller supports only PT1000 probe types.

Variants

Description	Part Number
Mercury Mk2 Mini-Pack	PR0710-MPA
Intuitive Mercury Mini-Pack	PR0750-MPA
Mercury MK2 Transducer Interface	PR0722

Configuration

The controller provides two configuration options: -

Display value	Controller Type
1	Pack Controller
2	Condenser Controller

Compatible Network Interfaces

Mercury and Intuitive Mercury controllers are capable of connecting to either a TCP/IP local area network, an RS485 Genus compatible network, an RDM wireless mesh network or they can be used in standalone mode with no network output. To connect to a network you must add the correct communications module. Connecting to any of these communication modules will automatically be detected on power up and will affect the set up screens available to you.

Description	Part Number
IP Futura (Single Mercury to IP Interface)	PR0016
RS485 Interface (Single Mercury to RS485 Interface)	PR0026
Mercury IP Switch (IP support for 10 controllers)	PR0018
Mercury IP Switch with Pressure/Humidity Inputs	PR0018-PHI
Wireless Mesh Interface (for single Mercury)	PR0730

The Intuitive Mercury Controller is supplied as standard with an internal RS232 network card, this allows connection to any of the above external network interfaces. Three alternative internal network cards are also available, these can be supplied factory fitted as an option or purchased separately as an interface kit.

Description	Part Number
Intuitive Internal IP Network Card Interface Kit	PR0770
Intuitive Internal RS485 Network Card Interface Kit	PR0771
Intuitive Internal Wireless Mesh Network Card Interface Kit	PR0772

Front Display Features

LED's: -

Not Used

Not Used

Not Used

Not Used

On-Line

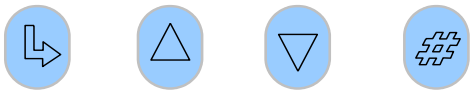
Off	No network attached
Flashing	Attempting to Log on to network
Steady	On-line

Service (See Parameter 10 for setup)

Alarm

HACCP

Keys



Enter Up Down

Note: Function keys illuminate when pressed, illumination is turned off 20 seconds after the key is used. Press and hold the defrost button to force a manual defrost

Main Display

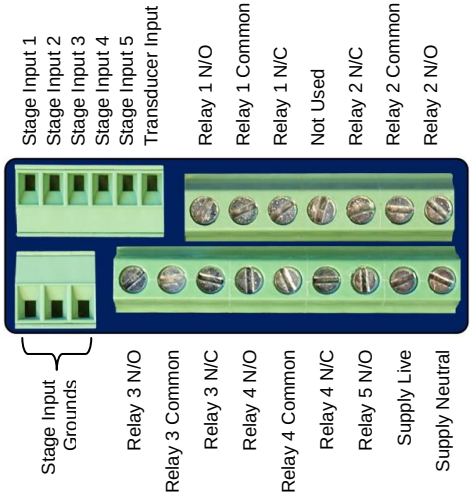
4 character LED display, used to Suction or Discharge pressure and status messages.

Note the Intuitive Mercury display is Green in colour when lit.

Connections

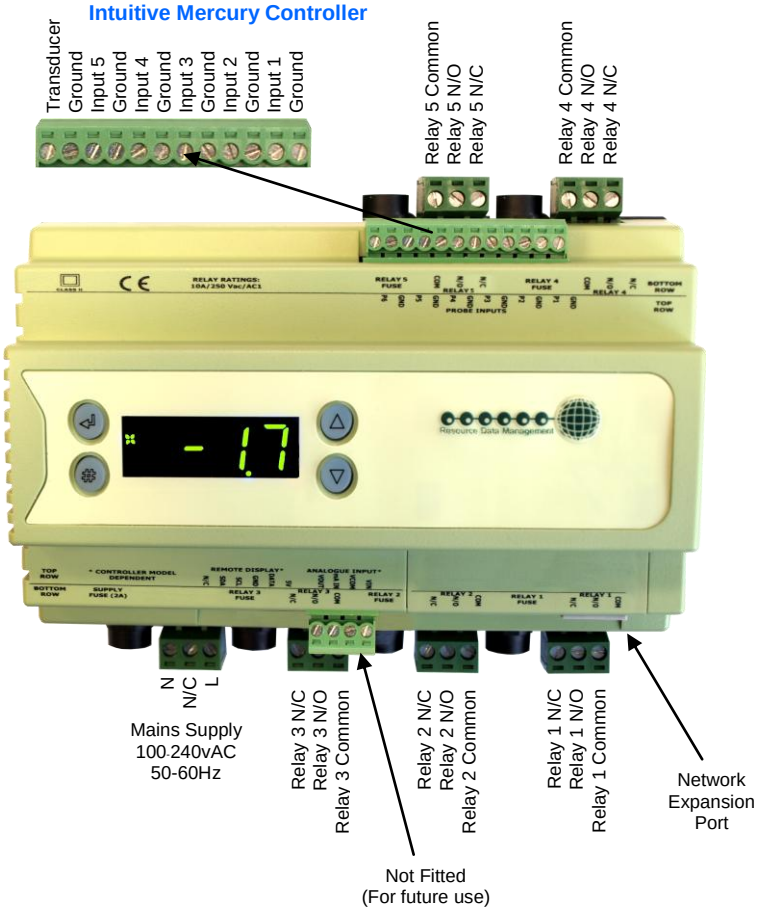
Mercury Mk2

Input and Output connections are made to the back of the controller, the RS232 communication port is on the side. The diagram shows the connection detail. Inputs and outputs are assigned according to the chosen configuration. See Input/Output tables for further details on connections.



Ensure that all power is switched off before installing or maintaining this product

Intuitive Mercury Controller

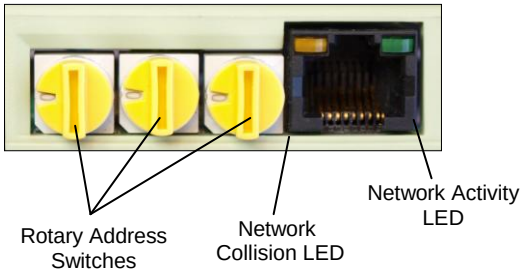


Intuitive Mercury Network Expansion Options

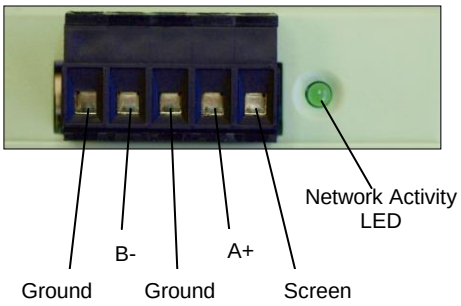
RS232 Network Card (Default)

The Intuitive Mercury is supplied with an RS232 Network Card fitted as standard. Some example optional network cards are shown below

IP Network Card (PR0770)



RS485 Network Card (PR0771)



PR0772 Wireless Mesh Option also available. The network interfaces work in the same way as there external counterparts.

Input and Output Allocation Table

The following tables indicate; on a controller type basis, the functions of the inputs and outputs.

I/O	Type 1 Pack	Type 2 Condenser	Comments
Stage Inputs 1-5	Status Input or Temperature Probe	Status Input or Temperature Probe	See Status Input
Transducer Input	Pressure Transducer	Pressure Transducer	See Interface Board
Relays 1-5	Compressor or Loader	Fan	Wire to N/O Contacts

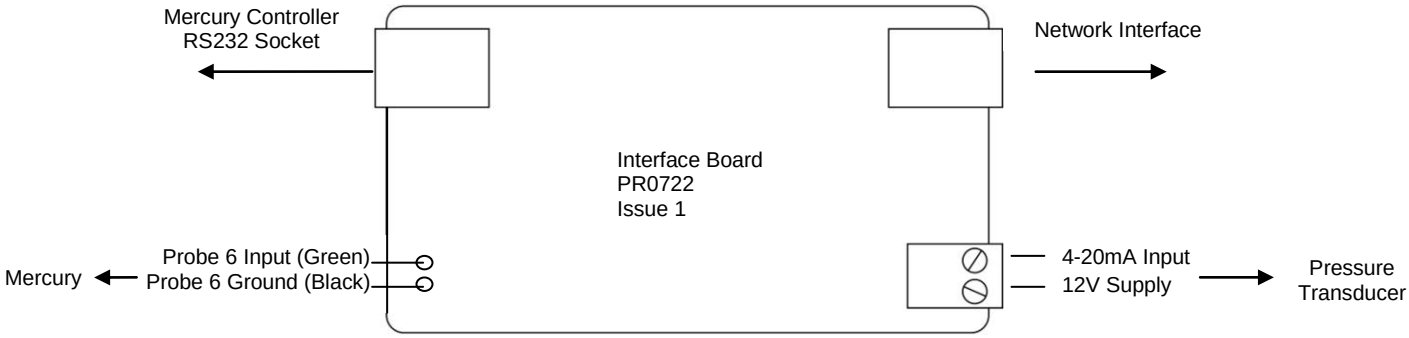
Alarm relay

The alarm relay is assigned automatically to the first free relay that has not been utilised in the stage programming. At first power on this will be Relay 1 until programming of the output stage is complete.

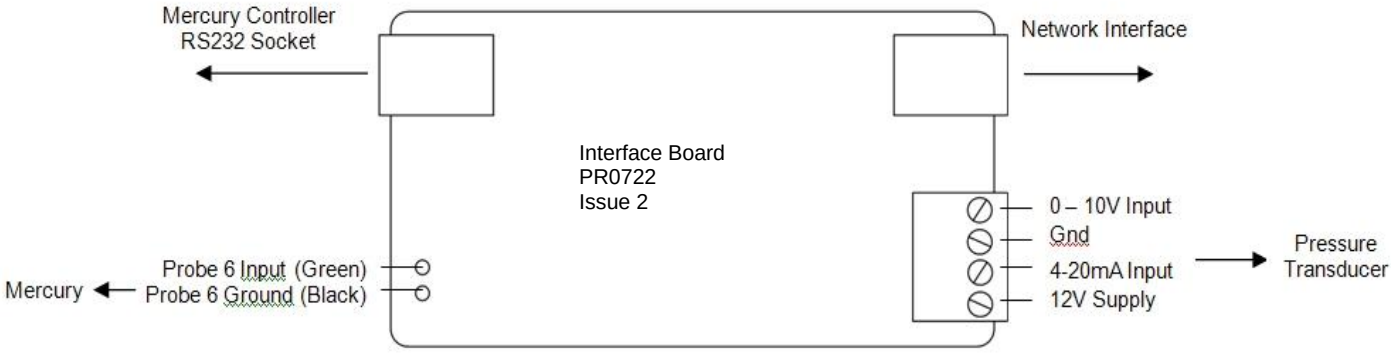
The relay is energised with no alarm and de-energised when in alarm. Any alarm condition will activate the alarm relay.

Pressure Transducer Connection

The controller uses an external 4-20ma interface board (PR0722) which allows a pressure transducer to be connected to the probe 6 input. Pressure transducers must be of the current loop 4-20mA type. Excitation voltage (12 Vdc) is provided for the transducer. The range of the transducer will vary according to the application, the Span and Offset parameters allow for this.
Issue 2 Interface has a 4-20mA input and a 0 – 10V input for transducer.
Note: The PR0722 works with PT1000 probes only (units selected as 0 or 1)



Note: Interface Board PR0722 Issue 1 is now obsolete and is superseded by Interface Board PR0722 Issue 2



The RJ45 socket labelled as “Mercury Controller” on the interface board connects to the Mercury Mini Pack controllers RS232 Comms port. A standard CAT5 patch lead should be used. Maximum cable length 0.1m.
The Connector labelled “Probe INP” connects to Input 6 on the Mercury controller’s Probe 6 input. Maximum cable length 0.1m.

Setting up the controller

Access to the controller can be achieved several ways

- Through the front mounted buttons
- Direct access by PC or palm top into the controller's RS232 comms port. This requires a software package available on the RDM website
- Through legacy front end panels on 485 networks
- Through the RDM Data Manager.
- Across an IP network. (Current controller IP address required)

Setup through front buttons

ENTER

UP

DOWN

To enter setup mode, hold the Enter and Down buttons together for approximately 3 seconds until the message “Ent” appears on the display. Now press the Enter button again to enter the function menu. IO will be displayed. Scroll up or down to go through the list.

Setup Function Menu (Common to all types)

Display	Option	Explained in Paragraph		Display	Option	Explained in Paragraph
IO	View Inputs / Outputs and States	Input / output table		nEt	Set/view network configuration	Network Configuration
PArA	Set/View Parameters	Set view parameters		SoFt	View software version	
Unit	Probe type and Celsius/Fahrenheit option	Set View Unit		OFSt	Probe Offset	Probe Offset
inP	Sets 4-20mA or 0-10V	Input		test	Test Outputs	Test Outputs
tyPE	Set/View Controller Type	Set/view controller type		ESC	Exit Setup mode	
rtc	Set/view Clock (rtc = Real Time Clock)	Real Time Clock				

Recommended set-up method

If you are not connecting to a network and want to set up the controller through the buttons we recommend you use the following order from the function menu.

rtc. Real time clock (This will automatically synchronise on network systems)

a. Use the up or down buttons to scroll through the display until the display reads “rtc”
b. Press enter. The display will show “t-1”. press enter again
c. Scroll hours up or down (0 – 23) press enter
d. Use up button to select “t-2”, press enter
e. Scroll minutes up or down (0 – 59) press enter
f. Repeat for t-3 (seconds 0 – 59)
g. Repeat for t -4 (Days up to 31)
h. Repeat for t -5 (months up to 12)
i. Repeat for t -6 (Year up to 99)
j. Use up button to display “ESC”, press enter to display “rtc”

Time clock is now set

type. Set/view controller type

a. From the function menu scroll to select type, press enter
b. Use the up/down buttons to scroll through case/coldroom configuration types. (see configuration table on page 3)
c. Press enter.
d. Scroll to select “ESC”
e. Press enter

Controller type configuration is now set

Inp

The INP menu option is used to configure the controller to operate with either a 4–20mA or 0–10V input signal.

Set to 0 for 4 – 20mA input
Set to 1 for 0 – 10V Input

PArA. Set/view parameters (This can be achieved at the network front end)

a. From the function menu scroll to select PArA
b. Pressing Enter while PArA is displayed will enter the parameter menu. The first parameter option will be displayed as P-01. Pressing the Up or Down button will present the other parameter options P-02, P-03 etc. See the parameter list below to find what parameter number corresponds to which actual parameter. Pressing the Enter button will show the current value of the selected parameter. Press Up or Down to modify the value and press Enter again to save the value. The parameter list number will be displayed again. Two other options are present in the parameter menu – dFLt and ESC. Selecting ESC will exit setup mode. Selecting dFLt will reset all parameters back to the default values for the current type of controller.

Unit. Set/view temperature unit and Probe type

From the function menu scroll to select Unit
Press enter and the value will be displayed: -

Probe Types

0 for PT1000 Celsius
1 for PT1000 Fahrenheit

This variant of controller can only use PT1000 probe types.

Use the up or down keys to select the units and press enter.

Note
If Probe type selected is degrees Celsius then Control Pressure will be in Bar.
If Probe type selected is degrees Fahrenheit then Control Pressure will be in PSI.

This function is now complete

Parameter Tables

Not all parameters apply to all controller types, for example P-19 is Condenser Offset which only applies to the Condenser Controller (Type 2), this parameter will not appear if the controller is set up as a type 1 (Pack Controller). In the following table, the type columns on the right hand side will be greyed out if that parameter does not apply to that controller type.

Number	Parameter	Range Bar (Psi)	Step	Units	Default Bar (Psi)	Type 1 Pack	Type 2 Condenser
P-01	Transducer Span* (Pack)	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	13.8 (200)	✓	
	Transducer Span* (Condenser)	3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	34.4 (499)		✓
P-02	Transducer Offset*	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	0.0 (14)	✓	✓
P-03	Target (Pack)	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	2.1 (30)	✓	
	Target (Condenser)	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	12.7 (184)		✓
P-04	Target Above	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	0.5 (7)	✓	✓
P-05	Target Below	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	0.5 (7)	✓	✓
P-06	Stages	0 - 5	1		0	✓	✓
P-07	Stage On Delay	00:00 - 60:00	00:01	mm:ss	00:10	✓	✓
P-08	Stage Off Delay	00:00 - 60:00	00:01	mm:ss	00:10	✓	✓
P-09	Fail Off / On	0 = Off 1 = On	1		0	✓	✓
P-10	Service Time	0 - 128	1	K Hrs	60	✓	✓
P-11	Run Proof	0 = Off 1 = On	1		0	✓	✓
P-12	Optimisation Limit	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	2.0 (29)	✓	✓
P-15	Control Type	0 = Fixed, 1 = Floating	1		0		✓
P-16	Probe Select	0 = Probe 1,1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5	1		0		✓
P-17	Low Limit	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	8.2 (119)		✓
P-18	High Limit	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	23.0 (334)		✓
P-19	Condenser Offset	0.0 - 10.0	0.1	°C	6.0		✓
P-44	Press 0°C / 32°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	6.0 (87)		✓
P-45	Press 10°C / 50°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	8.2 (119)		✓
P-46	Press 20°C / 68°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	10.9 (158)		✓
P-47	Press 30°C / 86°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	14.2 (206)		✓
P-48	Press 40°C / 104°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	18.1 (262)		✓
P-49	Press 50°C / 122°F	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	23.0 (334)		✓
P-50 ↓ P-54	Stage 1 Relay 1 ↓ Stage 1 Relay 5	0 = Off. 1 = On	1		0	✓	
P-55 ↓ P-59	Stage 2 Relay 1 ↓ Stage 2 Relay 5	0 = Off. 1 = On	1		0	✓	
P-60 ↓ P-64	Stage 3 Relay 1 ↓ Stage 3 Relay 5	0 = Off. 1 = On	1		0	✓	

P-65 ↓ P-69	Stage 4 Relay 1 ↓ Stage 4 Relay 5	0 = Off. 1 = On	1		0	✓	
P-70 ↓ P-74	Stage 5 Relay 1 ↓ Stage 5 Relay 5	0 = Off. 1 = On	1		0	✓	
P-20	Alarm Delay	00:00 - 99:00	01:00	mm:ss	05:00	✓	✓
P-21	HP Alarm	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	4.1 (59)	✓	✓
P-22	LP Alarm	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	0.6 (9)	✓	✓
P-23	LP Shutdown	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi	0.4 (6)	✓	✓
P-30 ↓ P-34	Status Fault 1 (Pack) ↓ Status Fault 5 (Pack)	0 = Unused, 1 = Probe 2 = Comp N/O, 3 = Comp N/C 4 = Gen N/O, 5 = Gen N/C 6 = Std N/O, 7 = Std N/C	1		0	✓	
P-30 ↓ P-34	Status Fault 1 (Condenser) ↓ Status Fault 5 (Condenser)	0 = Unused, 1 = Probe 2 = Cond N/O, 3 = Cond N/C 4 = Gen N/O, 5 = Gen N/C 6 = Std N/O, 7 = Std N/C	1		0		✓
P-40	Status Fault Delay	00:00 - 60:00	00:01	mm:ss	00:10	✓	✓
P-41	General Fault Delay	00:00 - 60:00	00:01	mm:ss	00:10	✓	✓
dFLt	Restore default values					✓	✓

* Span and Offset allows for the full range of the transducer to be used by the controller.
Span is the full range of the transducer
Offset is the value below zero.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)

Parameter Descriptions

Number	Parameter	Description
P-01	Transducer Span	Range of the transducer
P-02	Transducer Offset	Transducer value below zero
P-03	Target	Pressure target, control will try to maintain this pressure
P-04	Target Above P-03	Set-point above the target, used to obtain a “dead-band”
P-05	Target Below P-03	Set-point above the target, used to obtain a “dead-band”
P-06	Stages	Number of stages in the system
P-07	Stage On Delay	Delay time between stages on
P-08	Stage Off Delay	Delay time between stages off
P-09	Fail Off / On	The following will occur in the event of pressure transducer fault. If set to On then all Compressors or Fans will turn On in the event of a transducer failure. If set to Off then all Compressors or Fans will turn Off in the event of a transducer failure.
P-10	Service Time	Time controller is running (in 1000 x hours) before the service icon (Spanner icon) comes on. Reset the spanner icon to off by changing this parameter to 0 and then back to the desired service interval.
P-11	Run Proof	See section : Run Proof
P-12	Optimisation Limit	This is an offset that is added to the target pressure when using the Data Manager Energy feature Pack Optimisation. For example if target pressure is 2.1 Bar and Optimise Limit set to 0.5 Bar. The remote optimise command will only be able to optimise the current suction setpoint up to a maximum of 2.6 Bar
P-15	Control Type	Selects between Fixed or Floating. For Condenser control only. Fixed uses the set-point parameter as its target (P-03) Floating uses the temperature of a selected probe converted to a pressure as the set-point
P-16	Probe Select	Selects the probe that measures the “floating” temperature (Note : This would be fitted to the Air On of the Condenser) See note : Floating Head Pressure
P-17	Low Limit	Stops the floating pressure target from going below this level
P-18	High Limit	Stops the floating pressure target from going above this level
P-19	Condenser Offset	Allows for an offset to be added to the ambient temperature probe used in the “floating” set-point feature.
P-20	Alarm Delay	Delay before HP and LP alarms are signalled
P-21	HP Alarm	HP alarm set-point
P-22	LP Alarm	LP alarm set-point, stage off when reached
P-23	LP Shutdown	Point at which LP Shutdown alarm is generated. Note as soon as the LP Shutdown setpoint is reached any Compressor/Condenser stages, for the associated section, still operating will go off immediately and does not wait for the LP Shutdown alarm to be created.
P-30 ↓ P-34	Status Fault 1 ↓ Status Fault 5	Used to select the type of input required
P-40	Status Fault Delay	Time delay before status faults are activated
P-41	General Fault Delay	Time delay before general faults are activated
P-44	Press 0°C / 32°F	Used to program the temperature to pressure conversion for floating pressure use.
P-45	Press 10°C / 50°F	Used to program the temperature to pressure conversion for floating pressure use.
P-46	Press 20°C / 68°F	Used to program the temperature to pressure conversion for floating pressure use.
P-47	Press 30°C / 86°F	Used to program the temperature to pressure conversion for floating pressure use.
P-48	Press 40°C / 104°F	Used to program the temperature to pressure conversion for floating pressure use.
P-49	Press 50°C / 122°F	Used to program the temperature to pressure conversion for floating pressure use.
P-50 ↓ P-74	Stage 1 Relay 1 ↓ Stage 5 Relay 5	Select the output for this stage
dFLt	Restore default values	Restores factory set points

Stage Inputs

Inputs 1-5 can be set up as the following:

Value	Type	Description
0	Unused	Input is not used
1	Probe	Set input as a probe input. For use with Condenser Float feature or as a monitor probe with no alarm.
2	Condenser/Compressor Normally Open	When selected apply 0V return signal to generate Condenser/Compressor Fault.
3	Condenser/Compressor Normally Closed	When selected remove 0V return signal to generate Condenser/Compressor Fault.
4	General Normally Open	When selected apply 0V return signal to generate General Fault.
5	General Normally Closed	When selected remove 0V return signal to generate General Fault.
6	Standby Normally Open	When selected apply 0V return signal to place controller into standby and generate Standby alarm.
7	Standby Normally Closed	When selected remove 0V return to place controller into standby and generate Standby alarm.

Control - Staged Operation

Staged operation requires the output relays to be “mapped” to a particular stage. Each stage, there are 5 stages, has to have at least 1 relay assigned for the controller to operate correctly. Use P-06 to define the total number of stages required. Use parameters P-50 to P-74 to assign relays to each stage. More than one relay can be assigned to a particular stage. Relays can be assigned to a number of stages. As the pressure rises above the target setpoint, plus the target above value, the controller will enter Stage 1 after the stage on delay (P-07) has expired. At this point any relay assigned in Stage 1 will come on and the stage on delay timer will be reset. If the pressure remains above the setpoint, plus the target above value and the stage on delay has expired for a second time the controller will enter stage 2. At this point any relay assigned in Stage 2 will come on. Note if a relay has been assigned in Stage 1 but not used in Stage 2 then it will go off at this point. The reverse occurs when the pressure falls below the setpoint plus the target below value. The controller will step down the stages using the stage off delay (P-08) until all stages are off.

For example if set to Pack and the pack has 4 Compressors the following could be set: -

Stage1 : Rly 1 =On, **Stage2**: Rly 1 and Rly 2 = On, **Stage3:** Rly 1 ,Rly 2 and Rly 3 = On. **Stage4:** Rly 1, Rly 2, Rly 3 and Rly 4 = On. This would stage relay 1 through to four on after the appropriate stage on delay if the pressure is above the target setpoint and differentials. Note : In the above example Relay 5 would be assigned as the Alarm Relay

Please note when the Condenser type is selected only the number of condenser stages is required.

Run-Proof

This is a “global” parameter if set to on then the Status fault inputs are used to prove that compressors are running. Configure the status inputs, using either Compressor Normally Closed or Compressor Normally Open, which correspond with each relay output. If the relay output is energised and the run proof signal isn’t returned within the specified time period then the compressor relay will go off, the compressor will be taken out of the control strategy until the run proof has been reset and a Compressor fault alarm will be created. Note the compressor fault alarm can be re-aliased in the Data Manager to “Run Proof” or similar. The run-proof feature uses the status fault delay (P-40) and all run proof signals must be returned within this delay period. Run proofs are used with compressor (Comp) stages only.

To reset the run proof for any stage, after an inspection has been carried out, and return the compressor back into the control strategy use the display menu item tESt. The override option is used to manually turn on the compressor output. If the proof signal is returned within the allotted time delay the compressor is allocated back into the control strategy. If the proof isn’t returned the compressor relay will go off and remain out of the control strategy.

Another process used to reset a run proof alarm is by changing parameter P-11 from 1 to 0 (On to Off). This clears **all** run proof alarms on **all** compressors which are currently out of the control logic due to run proof feature. Changing P-11 from 0 back to 1 (Off to On). The compressor(s) will then be available for selection by the control logic. If the compressor is selected by the control strategy and the run proof signal is then not returned within the allotted time delay then it will fail and will be removed from the control logic again. Alternatively if the controller is power cycled then it will clear out any current run proof alarms.

Floating Head Pressure

When condenser control is achieved using the “Floating Head” pressure mode the temperature to pressure parameters must be used to profile a pressure curve from the air on temperature probe for the condenser
(P-44 to P-49). The value read from the temperature probe is added to a “Condenser Offset” (P-19) and then converted to a pressure. This converted pressure replaces the “Target Setpoint” (P-03) as the target pressure and P-03 is only used as a default; for instance when the probe is disconnected or develops a fault. Low and high pressure levels allow for a lower and upper limit to be set for the target pressure range and the target pressure can never be any value out with this range. The air on temperature can be read from probe inputs 1 to 5 and is settable via parameter (P-15).

Network Configuration

The final section to setup is the network address. In all instances, this must be done before the controller is plugged into the site network. The controllers have an auto-initialise function, which will automatically log the device onto the site network. If the wrong address has been entered onto the network, you will have to reset the controller address by setting the address to 00-0, and then re-enter the correct address. (You may have to deregister the wrong address from the home system as well).

To set the controller onto a network you must first connect the controller to a communications module. This is either a: -

- 485 Legacy, or
- IP Futura
- Mercury Switch

485 Legacy module

485 legacy support the following protocol: -

- Genus

Connecting a 485 legacy module to the controller will govern which set up screens are made available.

Display	Option
485t	485 Network Type
485A	485 Address/Name
gAdd *	Show underlying network address assigned to Controller
rLog *	Re-log the controller back onto the network
CLrA *	Clear the address/name from the controller
ESC	Exit network menu. **N.B.** this option **must** be selected to save any changes made in this menu

* These options are only available when the network type is set to Genus compatible.

The 485t option shows a value representing the network type. The possible values are:

Value	Network Type
1	Genus compatible (all versions)

The 485A option shows a value representing either the name of the controller in a Genus compatible network.

The value shown is of the form 05-6. This means the controller would try to log onto a Genus compatible network using the name 'RC05-6'.

The following options are also available when the network type is set to Genus compatible.

The gAdd option displays (in hexadecimal format) the underlying network address assigned to the controller when it was logged onto the network.

The rLog option allows the controller to be logged back onto the network with its current name. The 'rLog' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

Fast Network Address Reset

The CLrA option will clear out the network address and name in the controller. The 'ClrA' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

To enter this mode, hold the Enter, Up and Down buttons together for approximately 3 seconds until the message CLrA appears on the display. CLrA is the first option in the menu consisting of the following options:

Display	Option
CLrA	Clear the address/name from the controller
ESC	Exit Setup mode

Pressing the Enter button to select the CLrA option will cause the 'CLrA' message to flash for confirmation, if the network type is set to Genus compatible. Press the Enter button to execute the command, Up or Down buttons to cancel. If the network type is not set to Genus compatible then the ClrA message will not flash and the ESC option can be used to exit the menu.

IP Futura module

In an IP system there are two options

- IP-L
- IP-r

IP-L allows you to fix an IP address into the controller, which you would use when you are connecting the controllers onto a customer's local area network. This would allow the customer to view each controller using Internet Explorer

IP-r allows you to give each controller on the system a unique number. This number is then allocated a dynamic IP address by the system DHCP server (such as the RDM Data Manager or Data Director)

IP-L

To configure the communication module for IP-L, set all three rotary switches to zero. The module should then be connected to the controller.

1. nEt. From the function menu you can now select nEt
   - Press enter and the display will show "IP-L", press enter
   - You can now set the address using the table below

Display	Option
IP-1	IP Address byte 1
IP-2	IP Address byte 2
IP-3	IP Address byte 3
IP-4	IP Address byte 4
nL	Network Mask Length
gt-1	Gateway Address byte 1
gt-2	Gateway Address byte 2
gt-3	Gateway Address byte 3
gt-4	Gateway Address byte 4
ESC	Exit network menu. **N.B.** this option **must** be selected to save any changes made in this menu

IP-r

To configure the communication module for IP-r, set the three rotary switches to give each controller a unique identifier. The module should then be connected to the controller and the network.

2. nEt. From the function menu you can now select nEt
   - Press enter and the display will show "IP-r", press enter
   - You can now view only the address given by the DHCP server

To ease setup, a single network mask length value is used. If the address has been specified with a network mask value in dotted IP format e.g. 255.255.255.0 then the table below gives the conversion:

Mask	Length	Mask	Length	Mask	Length
		255.255.254.0	23	255.254.0.0	15
255.255.255.252	30	255.255.252.0	22	255.252.0.0	14
255.255.255.248	29	255.255.248.0	21	255.248.0.0	13
255.255.255.240	28	255.255.240.0	20	255.240.0.0	12
255.255.255.224	27	255.255.224.0	19	255.224.0.0	11
255.255.255.192	26	255.255.192.0	18	255.192.0.0	10
255.255.255.128	25	255.255.128.0	17	255.128.0.0	09
255.255.255.0	24	255.255.0.0	16	255.0.0.0	08

Viewing Input / Output Tables

Apart from setting up the controller, you can also view the status of the inputs and outputs.

1. IO. View Inputs / Outputs and States
   a. From the function menu, select "IO", press enter
   b. You can now scroll through the IO tables as set out below

Input/Output table

Number	IO	Range Bar (Psi)	Step	Units
I-01	Suction Pressure / Discharge Pressure	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi
I-10	Probe 1	-49 to 60 (-56.2 to 140)	0.1	°C/°F
I-11	Probe 2	-49 to 60 (-56.2 to 140)	0.1	°C/°F
I-12	Probe 3	-49 to 60 (-56.2 to 140)	0.1	°C/°F
I-13	Probe 4	-49 to 60 (-56.2 to 140)	0.1	°C/°F
I-14	Probe 5	-49 to 60 (-56.2 to 140)	0.1	°C/°F
I-20	Status 1	0 = OK. 1 = Alarm. 2 = Unused	1	---
I-21	Status 2	0 = OK. 1 = Alarm. 2 = Unused	1	---
I-22	Status 3	0 = OK. 1 = Alarm. 2 = Unused	1	---
I-23	Status 4	0 = OK. 1 = Alarm. 2 = Unused	1	---
I-24	Status 5	0 = OK. 1 = Alarm. 2 = Unused	1	---
O-01	Relay 1	0 = Off. 1 = On	1	---
O-02	Relay 2	0 = Off. 1 = On	1	---
O-03	Relay 3	0 = Off. 1 = On	1	---
O-04	Relay 4	0 = Off. 1 = On	1	---
O-05	Relay 5	0 = Off. 1 = On	1	---
O-11	Optimise (Pack) Float (Condenser)	-3.4 to 50.0 (-49.3 to 725)	0.1	Bar/Psi
O-21	Run Time	0 - 128	1	K Hrs
O-22	Stage	1 - 5	1	---

Alarm Messages

The following alarms and messages can appear on the Mercury Display,

Display Message	System Status
HP	High Pressure
LP	Low Pressure
Sd	Low Shutdown
Tran	Transducer Fault
Co 1	Compressor / Condenser 1 Fault
Co 2	Compressor / Condenser 2 Fault
Co 3	Compressor / Condenser 3 Fault
Co 4	Compressor / Condenser 4 Fault
Co 5	Compressor / Condenser 5 Fault
gEn 1	General Fault 1

Display Message	System Status
gEn 2	General Fault 2
gEn 3	General Fault 3
gEn 4	General Fault 4
gEn 5	General Fault 5
Prb 1	Temperature Probe 1 Fault
Prb 2	Temperature Probe 2 Fault
Prb 3	Temperature Probe 3 Fault
Prb 4	Temperature Probe 4 Fault
Prb 5	Temperature Probe 5 Fault
Stby	Controller in Standby

Network Alarms

The table below shows the text and associated type number that is sent to the system "front end". The type number is normally used to provide different alarm actions.

Alarm text	Type # (index)
High Pressure	8
Low Pressure	9
Low Shutdown	10
Transducer Fault	6
Probe 1 (Fault)	6
Probe 2 (Fault)	6
Probe 3 (Fault)	6
Probe 4 (Fault)	6
Probe 5 (Fault)	6
Comp / Cond 1	3

Alarm text	Type # (index)
Comp / Cond 2	3
Comp / Cond 3	3
Comp / Cond 4	3
Comp / Cond 5	3
General Fault 1	20
General Fault 2	20
General Fault 3	20
General Fault 4	20
General Fault 5	20
Controller in Standby	20

Probe Offset

This feature allows each probe value to be modified by an “offset” to take into account long cable runs. Offset values are from -10^{O}C (-18^{O}F) to +10^{O}C (+18^{O}F) and on a channel basis. Example C1 = Probe 1.

Test Relay Outputs

Selecting the “tESt” option from display software menu allows for the relay outputs to be tested.
It can also be used to reset a compressor that has been locked out after a “Run Fail” by selecting the relay and forcing it on and then off again. This renters the compressor back into the control algorithm for selection. See Run Proof for further information.

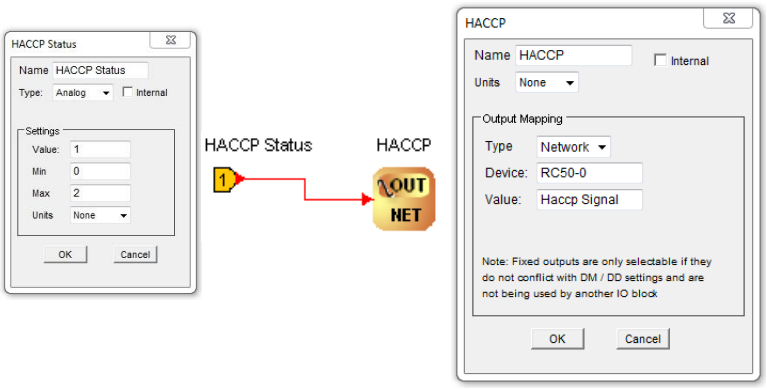
Remote Commands

The following commands can be used by a Data Builder program: -

Command	Value to send	Description
Optimisation	0 1 2 3 4	Stay Zero Up Down None
Haccp Command	0 1 2	HACCP LED OFF HACCP LED On HACCP LED Flashes
Button Command	0 1 2	Buttons backlights Off Buttons backlights On Buttons Backlights Flash

Use an “Analogue Out” block configured to the controller name and in the value field type in the command you require. Use a “Setting block” as the input to the “Analogue Out” block to send the Value.

See Example on the right, which turns on the HACCP LED.



Specification

	Mercury Mk2 Mini Pack Controller PR0710-MPA	Intuitive Mercury Mini-Pack Controller PR0750-MPA
Power requirements		
Supply Voltage Range	100 - 240 Vac ±10%	100 - 240 Vac ±10%
Supply Frequency	50 - 60 Hz	50 - 60 Hz
Maximum supply current	5.2 Amps (when relay 5 is fully loaded)	2 Amps
Typical supply current	<1 Amp	<1 Amp
General		
Operating temperature range	+5^{0}C to +50^{0}C	+5^{0}C to +50^{0}C
Storage temperature range	-20^{0}C to +65^{0}C	-20^{0}C to +65^{0}C
Environmental	Indoor use at altitudes up to 2000m, pollution degree 1, installation category II. Voltage fluctuations not to exceed ±10% of nominal voltage.	Indoor use at altitudes up to 2000m, pollution degree 1, installation category II. Voltage fluctuations not to exceed ±10% of nominal voltage.
Size	78mm (W) x 36mm (H) x 110mm (D)	157mm (W) x 67mm (H) x 120 (D)
Approx Weight	170 grams	500 grams
Safety	EN61010	EN61010
EMC	EN61326; 1997 +Amdt. A1; 1998	EN61326; 1997 +Amdt. A1; 1998
Ventilation	There is no requirement for forced cooling ventilation	There is no requirement for forced cooling ventilation
Class 2 Insulation	**No** protective Earth is required and **none** should be fitted	**No** protective Earth is required and **none** should be fitted
Supply Fuse	The host equipment must provide a suitable external over-current protection device such as: - Fuse: 6.3A 240 Vac Antisurge (T) HRC conforming to IEC 60127	Built in fuse holder, fuse 2A 240Vac Antisurge (T) HRC conforming to IEC60127, 32 x 6.3mm
Or MCB	6A, 240 VAC Type C conforming to BS EN 60898	2A, 240 VAC Type C conforming to BS EN 60898 (Note: controller has integral 2A fuse)
Relay Fuse	Not Fitted	10A 240Vac Antisurge (T) HRC conforming to IEC60127, 32 x 6.3mm
Relay Specification		
Relays 1-4 Mechanical Exclusive common		
Max current	6A Resistive (CosØ = 1) 2A Inductive (CosØ = 0.4)	.10A Resistive (CosØ = 1) 3A Inductive (CosØ = 0.4)
Max voltage	250Vac, 30V dc	250Vac. 30V dc
Relay Fuse	N/A	10A 240Vac Antisurge (T) HRC conforming to IEC60127, 32 x 6.3mm
Relay 5 Mechanical Type (M) Common connected to supply live		Relay 5 Mechanical Type (M) Exclusive common
Max current	3A (non inductive), COSϕ=0.4 2A (inductive load) 200,000 operations	10A Resistive (CosØ = 1) 3A Inductive (CosØ = 0.4)
Max voltage	250Vac (Internal supply)	250Vac. 30V dc (external supply)
	For compliance with the LVD, relays 3, 4 and 5 commons must be at the same potential as the supply voltage	All relays are independent and can operate at different potentials to the supply voltage.

Warning: Relay 5 output has hazardous voltages (Supply input voltage potential)
This does not apply to the Intuitive Mercury controller

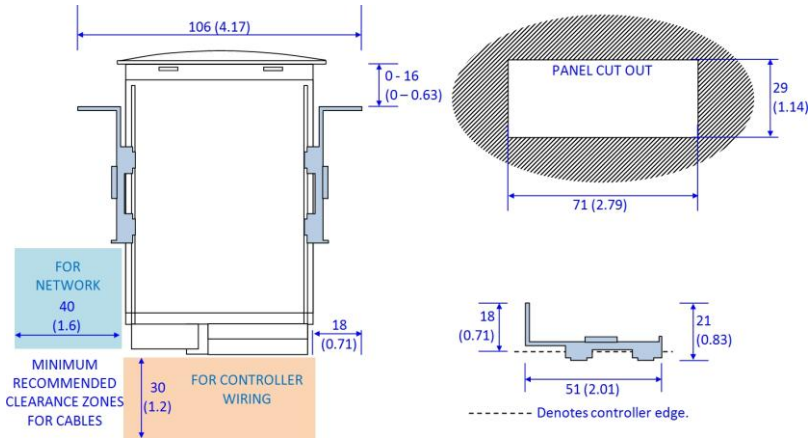
Inputs

Input resistance:	3.01K Ohms (for PTC or NTC type probes)
Input type	PT1000, NTC2K, 470R, 700R, 3K, 5K, 6K, NTC2K25, NTC10K or NTC10K(2)
Comms:	RS232 with flow control

Installation

Panel Cut-out and Clearances

Mercury Mk2 (Flush mount controller)



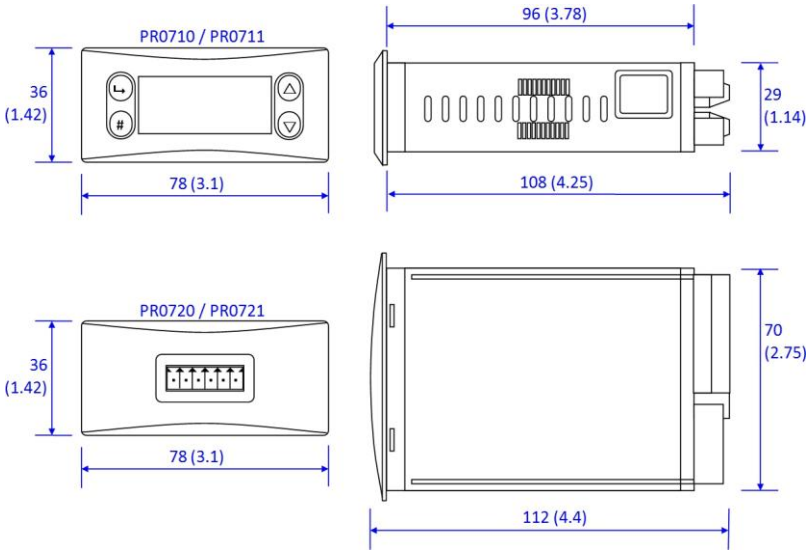
Fixing

The controller is fixed by sliding the 2 plastic retaining clips up to rear of the panel. These clips have a ratchet action and can be removed by holding in the clip sides and sliding back.

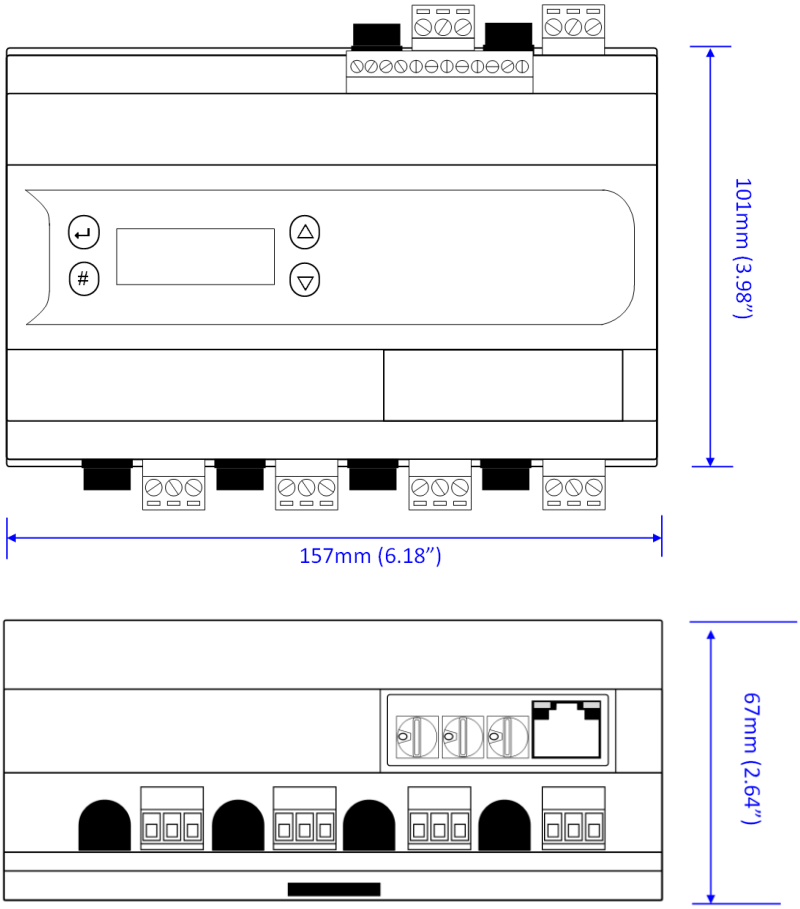
There is no requirement for forced cooling ventilation

Dimensions

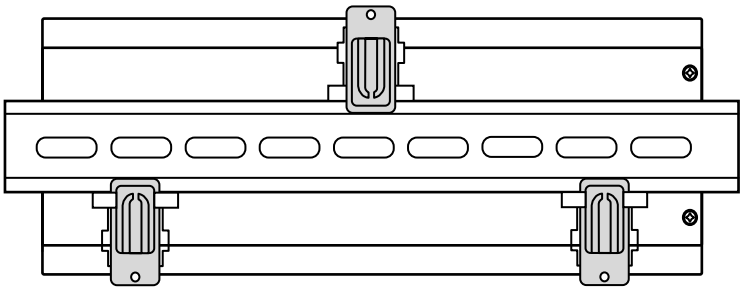
Mercury Mk2



Intuitive Mercury controller



Intuitive Mercury Mounting Instructions



Three clips fix the Intuitive Mercury securely to DIN rail. Pull each clip until it "clicks" to remove the controller. Each clip has a mounting hole to provide an alternative fixing mechanism to DIN mounting.

Cleaning

Do not wet the controller when cleaning. Clean the front by wiping with slightly damped lint free cloth.

Disclaimer

The specifications of the product detailed in this document may change without notice. RDM Ltd shall not be liable for errors or omissions, for incidental or consequential damages, directly or indirectly, in connection with the furnishing, performance or misuse of this product or document.

Ensure that all power is switched off before installing or maintaining this product

Revision History

Revision	Date	Changes
1.3	08/07/2011	Current Issue
1.4	07/12/2011	Reference to internal 4-20mA board removed, not currently supported in software.
1.5	31/01/2013	New external interface board added, probe options removed.